

**American College of Radiology
ACR Appropriateness Criteria®**

Hydrocephalus-Child

Variant 1: Infant. Suspected hydrocephalus. Abnormal prenatal imaging or signs or symptoms of elevated intracranial pressure. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	9	9	0	0	0	0	0	0	2	3	8
		References		Study Quality											
		14 (29850941)		4											
		13 (25559932)		4											
		25 (25469096)		0											
US head	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	1	0	0	0	1	0	4	2	5
		References		Study Quality											
		29 (33399982)		4											
		12 (31310185)		2											
		11 (30366745)		4											
MRI head without IV contrast abbreviated	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	1	1	6	2	3
		References		Study Quality											
		14 (29850941)		4											
		13 (25559932)		4											
		19 (24559278)		4											
		25 (25469096)		0											
		18 (23111234)		4											

CT head without IV contrast	May be appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	6	6	0	0	1	1	3	2	3	3	0
		References	Study Quality												
		21 (25082822)	2												
MRI head without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	0	1	10	0	1	0	0
		References	Study Quality												
		14 (29850941)	4												
		13 (25559932)	4												
		25 (25469096)	0												
CT head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	5	2	1	2	3	0	0	0	0
		References	Study Quality												
		21 (25082822)	2												
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	1	0	1	0	0	0	0	0
		References	Study Quality												
		21 (25082822)	2												
MRV head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	7	2	1	1	1	0	0	0	1
MRV head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	7	2	2	1	0	1	0	0	0
MRI head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	8	1	3	0	0	0	0	0	0
		References	Study Quality												
		14 (29850941)	4												
		13 (25559932)	4												
		25 (25469096)	0												

MRI head without IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	0	0	0	0	2	0	3	4	4
		References	Study Quality												
		28 (30704866)	4												
		14 (29850941)	4												
		25 (25469096)	0												
		13 (25559932)	4												
		33 (27989412)	4												
US head	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	0	0	1	1	0	1	1	3	6
		References	Study Quality												
		29 (33399982)	4												
		12 (31310185)	2												
		11 (30366745)	4												
CT head without IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	6	6	0	1	0	0	3	4	2	2	0
		References	Study Quality												
		28 (30704866)	4												
		33 (27989412)	4												
		21 (25082822)	2												
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	2	2	5	2	4	0	0	1	0	0	0
		References	Study Quality												
		28 (30704866)	4												
		14 (29850941)	4												
		25 (25469096)	0												
		13 (25559932)	4												
		33 (27989412)	4												
CT head with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	9	3	1	0	0	0	0	0	0

MRV head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	2	4	6	0	0	0	0	0	0
MRV head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	3	0	6	1	2	1	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	2	2	5	2	3	1	1	1	0	0	0
		References		Study Quality											
		21 (25082822)		2											
US head	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	9	2	2	0	0	0	0	0	0
		References		Study Quality											
		12 (31310185)		2											
		11 (30366745)		4											
MRI head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	8	1	3	0	0	0	0	0	0
		References		Study Quality											
		14 (29850941)		4											
		13 (25559932)		4											
		25 (25469096)		0											

Variant 5: Child greater than 1 year of age. Known hydrocephalus. No signs or symptoms of shunt malfunction. Follow-up imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
MRI head without IV contrast abbreviated	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	0	0	3	10
		References		Study Quality												
		14 (29850941)		4												
		26 (25859808)		4												
		19 (24559278)		4												

13 (25559932)	4
15 (23026416)	4

Variant 6: Child. Known hydrocephalus with cerebral spinal fluid diversion. Signs or symptoms of shunt malfunction. Follow-up imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
MRI head without IV contrast abbreviated	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	9	
		References	Study Quality													
		14 (29850941)	4													
		26 (25859808)	4													
		19 (24559278)	4													
		25 (25469096)	0													
		13 (25559932)	4													
		18 (23111234)	4													
		15 (23026416)	4													
Radiography head neck chest abdomen	Usually appropriate	Limited		☢☢☢ 0.03-0.3 mSv [ped]	8	8	1	0	0	0	0	2	1	4	5	
		References	Study Quality													
		45 (25259566)	3													
CT head without IV contrast	Usually appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	7	7	0	0	0	0	0	2	6	3	2	
		References	Study Quality													
		43 (27989409)	4													
		42 (26474707)	4													
		21 (25082822)	2													
		22 (25779098)	3													
MRI head without IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	1	0	1	6	3	2	

43 (27989409)	4
42 (26474707)	4
21 (25082822)	2
22 (25779098)	3

MRV head without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	8	1	3	0	0	0	1	0	0
US head	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	9	2	1	0	1	0	0	0	0

References	Study Quality
12 (31310185)	2
11 (30366745)	4

MRV head with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	8	2	2	1	0	0	0	0	0
MRI head with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	7	1	3	1	0	0	0	1	0

References	Study Quality
14 (29850941)	4
26 (25859808)	4
25 (25469096)	0
13 (25559932)	4
15 (23026416)	4

Appendix Key

A more complete discussion of the items presented below can be found by accessing the supporting documents at the designated hyperlinks.

Appropriateness Category: The panel's recommendation for a procedure based on the assessment of the risks and benefits of performing the procedure for the specified clinical scenario.

SOE: Strength of Evidence. The assessment of the amount and quality of evidence found in the peer reviewed medical literature for an appropriateness recommendation.

- **References:** The citation number and PMID for the reference(s) associated with the recommendation.
- **Study Quality:** The assessment of the quality of an individual reference based on the number of study quality elements described in the reference.

RRL: Relative Radiation Level. A population based assessment of the amount of radiation a typical patient may be exposed to during the specified procedure.

Rating: The final rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Median: The median rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Final tabulations: A histogram showing the number of panel members who rated the procedure as noted in the column heading (ie, 1, 2, 3, etc.).

Additional supporting documents about the AC methodology and processes can be found at www.acr.org/ac.